

glycemic control, leading to a reduced incidence of diabetes-related complications, including renal disease, cardiovascular disease, ophthalmic and diabetic foot complications. Liraglutide was associated with increased direct costs (EUR 56,628 versus EUR 52,450), driven by the acquisition cost of liraglutide. However, this was partially offset by the reduced cost of treating diabetes-related complications. Based on these estimates, liraglutide was associated with an incremental cost-effectiveness ratio of EUR 10,436 per QALY gained versus sitagliptin. **CONCLUSIONS:** Liraglutide 1.8mg was projected to improve clinical outcomes over sitagliptin as a result of reduced incidence of diabetes-related complications. Liraglutide is likely to be cost-effective from a health care payer perspective in Spain.

PDB70**COMPARING THE PROJECTED COST PER HBA1C REDUCTION OF EXENATIDE QW VERSUS LIRAGLUTIDE 1.8 MG FOR THE TREATMENT OF TYPE 2 DIABETES MELLITUS USING ALTERNATE DATA SOURCES**

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OBJECTIVES: Glucagon-like peptide-1 receptor agonists (GLP-1RAs), such as exenatide once weekly (EQW) and liraglutide (LIRA), are FDA-approved as treatment for type 2 diabetes mellitus (T2DM). Head-to-head studies and meta-analyses of these agents have reached different conclusions about their relative effectiveness. **METHODS:** We developed a decision-analytic model to evaluate the likely incremental cost-effectiveness of EQW versus LIRA 1.8 mg in T2DM patients, with effectiveness measured as reduction in glycated hemoglobin (HbA1c). The model structure tracks change in HbA1c and direct medical expenditure (drug, needle, adverse events [AEs]) over a 26-week time horizon, and allows patients to discontinue treatment due to AEs (nausea, diarrhea, vomiting, constipation, dyspepsia) after 1 or 3 months of therapy. Patients discontinuing treatment are assumed to return to their baseline HbA1c. We compared the outcomes (cost per 1% and 0.2% reduction in HbA1c) of models populated with clinical data from a head-to-head 26-week randomized, controlled trial (DURATION-6) and a meta-analysis conducted by Scott and colleagues (2012). Drug costs and other utilization costs were based on wholesale acquisition costs and published sources. **RESULTS:** For the base case, the projected total 6-month cost of EQW versus LIRA was \$2,444 and \$3,054, respectively. Using data from DURATION-6 and meta-analysis, compared with EQW, LIRA had a projected incremental cost per 1% reduction in HbA1c (ICER) of \$3,262 and \$18,578 over a 6-month time horizon, respectively. Compared with EQW, the projected 6-month cost per 0.2% reduction in HbA1c for LIRA was \$652 and \$3,716 based on data from DURATION-6 and meta-analysis, respectively. **CONCLUSIONS:** The projected cost per 1% reduction in HbA1c was lower with EQW than liraglutide 1.8 mg at 6 months. The difference in projected cost per HbA1c reduction varies significantly depending on the trial-based data sources used. Real-world data are needed to resolve the current uncertainties.

PDB71**COST-EFFECTIVENESS ANALYSIS OF HCG AND HUMAN GONADOTROPINS IN MEN WITH HYPOGONADOTROPIC HYPOGONADISM IN THE CONTEXT OF AN ASSISTED REPRODUCTION PROGRAM**

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OBJECTIVES: To evaluate the efficiency, in terms of incremental cost-effectiveness ratios (ICER), of human chorionic gonadotropin (hCG) and human gonadotropins, drugs used for male infertility due to hormonal disorder hypogonadotropic hypogonadism (HH), whose female partner has or doesn't have infertility problems, in the context of an assisted reproduction program. **METHODS:** Two different decision trees were developed to assess ICER of hCG and human gonadotropins. Firstly, hCG was compared to no treatment; secondly, human gonadotropins in combination with hCG were compared to hCG used alone. Effectiveness was measured as pregnancy and spermatogenesis respectively. Data were obtained from clinical studies, as well as efficacy of medical procedures. The proportion of couples, who needed fertility procedures, was determined according to experts' opinion. A ministry of health perspective was taken. Costs of medications were based on acquisition costs in 2012 Canadian dollars. Costs of medical procedures, as intrauterine insemination (IUI), in vitro fertilisation (IVF) and intra cytoplasmic sperm injection (ICSI) were based on 2012 fees of Québec's physicians. The time horizons adopted were based on the durations of drug treatment in clinical studies. **RESULTS:** The use of hCG in comparison with no treatment is cost-effective with an ICER of 20,915\$/CAN per man with HH for whom the partner got pregnant. Determinist sensitivity analyses showed that the ratio is more sensitive to the probability to use IVF or ICSI. In the second comparison, treatment with human gonadotropins is cost-effective with an ICER of 25,076\$/CAN per man that obtained spermatogenesis. Drug dosage is the element for which the ICER is more sensitive in the univariate determinist sensitivity analyses. **CONCLUSIONS:** Human gonadotropins and hCG are cost-effective for the treatment of men with HH. They can be reimbursed in the drug program for this indication with some restrictions about the duration of treatment.

PDB72**HEALTH ECONOMIC EVALUATION OF CANAGLIFLOZIN IN THE TREATMENT OF TYPE 2 DIABETES MELLITUS IN SWEDEN**

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OBJECTIVES: To evaluate the cost-effectiveness of canagliflozin in dual therapy as add-on to metformin compared to sitagliptin and glimepiride, as add-on to insulin (plus metformin) and in mono therapy compared to sulfonylurea in the Swedish setting from a societal perspective. **METHODS:** The IMS CORE Diabetes Model was used to evaluate the cost-effectiveness of canagliflozin (using a weighted average of 80/20 for the 100 mg and 300 mg dosage respectively) versus the aforementioned

comparators using Swedish-specific data, where available. Direct and indirect costs were reported in 2012 Euro [1 Euro (€) = 8.91 Swedish Krona] and an annual discount rate of 3% was applied on costs and effects. **RESULTS:** With inclusion of indirect costs the cost-effectiveness analyses indicate that in dual therapy when compared to sitagliptin as add-on to metformin, canagliflozin appears to dominate sitagliptin with average cost savings of 718 € and an average QALY gain of 0.011 and as add-on to metformin canagliflozin appears to dominate sulfonylurea with average cost savings of 600 € and an average QALY gain of 0.063. As add-on to insulin canagliflozin appears to dominate placebo with an incremental cost saving of 3339 € and an incremental QALY of 0.054. In mono therapy canagliflozin is cost-effective compared to sulfonylurea with an incremental cost-effectiveness ratio (ICER) of 1838 € per QALY. Probabilistic analysis of the four comparisons suggests a likelihood of above 50% of canagliflozin being cost-effective. Sensitivity analyses show that canagliflozin remains cost-effective when indirect costs were not included. **CONCLUSIONS:** Canagliflozin 100 mg and 300 mg (80/20 dose split) appears to be a cost-effective alternative to sitagliptin and glimepiride in dual therapy as add-on to metformin. Adding canagliflozin to insulin will be cost-effective compared with placebo. Canagliflozin is a cost-effective alternative to sulfonylurea in mono therapy.

PDB73**ECONOMIC EVALUATION OF BLOOD GLUCOSE POINT-OF-CARE TESTING IN THE INTENSIVE CARE UNIT**

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OBJECTIVES: Point-of-care testing of blood glucose (BG-POCT) is essential for safe insulin infusion in critically ill patients. Costs associated with BG-POCT are considered substantial, especially when more frequent monitoring is needed as with strict glucose control aiming for lower BG-levels. The objective of this study is to estimate the incremental cost-effectiveness of a strict BG-POCT guideline versus a loose guideline, from a hospital perspective. **METHODS:** This is a secondary analysis of a guideline implementation project aiming for normal BG-levels in three intensive care units in The Netherlands[1]. A Markov model including health states 'target glucose', 'hyperglycemia', 'hypoglycemia', and hospital death was developed to compare expected costs, number of patients within target and number of life years saved before and after guideline implementation. **RESULTS:** The analysis included 1.321 and 2.175 patients 12 and 24 months before and after implementation of the guideline, respectively. The number of BG-POCT increased from 4.2 [2.6 – 6.7] to 8.7 [4.1 – 11.2] per patient per day. Costs for BG-POCT increased with 72%. When taking total hospital costs and clinical effects into account, implementation of the strict glycemic control guideline reduces hospital costs with €134 during total inpatient stay, as patients spend less time in hypo/hyperglycemic events and had shorter stays in ICU and hospital (-0.5 and -1.1 day, respectively). This translates into expected cost savings of €13 per additional patient in target glucose and €10 per additional life year saved. The model outcomes are most sensitive to changes in ICU length of stay. **CONCLUSIONS:** This health-economic analysis shows that additional costs of BG-POCT with implementation of a strict glucose control guideline are offset against savings generated by reduced hypo/hyperglycemic events and length of stay in ICU and hospital. [1] Schultz, M.J., et al. Minerva Anestesiol, 2012. 78(9): p. 982-95.

PDB74**COST-EFFECTIVENESS OF SWITCHING TO BIPHASIC INSULIN ASPART FROM HUMAN PREMIX INSULIN IN PEOPLE WITH TYPE 2 DIABETES IN CHINA**

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OBJECTIVES: To evaluate long-term cost-effectiveness of switching from human premix insulin to biphasic insulin aspart (BIAsp 30) in people with type 2 diabetes mellitus (T2DM) in China. **METHODS:** The previously published and validated IMS Core Diabetes Model was used to project life expectancy, quality-adjusted life years (QALYs) and total direct medical costs over 30 years from a societal perspective. Patient characteristics and treatment effects were obtained from Chinese subgroup (n=1191) in the A,chieve® observational study. After treatment with BIAsp 30 over 24 weeks, patients' HbA_{1c} decreased by 1.6%, rate of major and minor hypoglycaemia decreased by 0.51 and 4.32 events per patient-year respectively. Treatment costs were based on insulin doses (35.8 IU daily for human premix insulin and 36.1 IU for BIAsp 30) and market retail prices in China. Management (concomitant medications, screening programmes, etc) and complication costs were obtained from Chinese published data in 2011 and adjusted to the price level of 2012 with the consumer price index. Costs and life years were discounted at 3% annually. One-way sensitivity analysis was performed. **RESULTS:** Switching to BIAsp 30 from human premix insulin was projected to reduce incidence of most diabetes-related complications, increase life expectancy by 0.732 years (13.457 vs 12.725) and improve quality-adjusted life years by 1.032 QALYs (9.487 vs 8.455) per patient. Although treatment and management costs increased by Chinese Yuan (CNY) 14,712 (52,329 vs. 37,617) and 1,857 (39,821vs. 37,964) respectively, complication costs reduced by CNY 96,198 (104,752 vs. 200,950); switching to BIAsp 30 from human premix insulin was associated with reduced total direct medical cost of CNY 79,628 (196,902 vs. 276,530). Sensitivity analyses demonstrated robustness of the results. **CONCLUSIONS:** Switching to BIAsp 30 from human premix insulin was associated with improvements in life expectancy and QALYs, and was a cost-saving treatment strategy for people with T2DM in China.

PDB75**COST-EFFECTIVENESS OF SAXAGLIPTIN AND LINAGLIPTIN IN COMBINATION WITH METFORMIN FOR TYPE II DIABETES: A DECISION-TREE ANALYSIS MODEL**

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OBJECTIVES: We conducted a cost-effectiveness analysis of two dipeptidyl-peptidase inhibitors, saxagliptin and linagliptin, used in combination with metformin for the treatment of Type II diabetes. **METHODS:** A decision tree model was developed using cost and effectiveness data for saxagliptin + metformin and linagliptin + metformin using published literature. Costs were evaluated using third party payer's perspective and included costs of drugs, physician visits, lab tests, hospital costs, and costs associated with adverse events. All costs were adjusted to 2013 dollars using consumer price index and were calculated for a period of one year. A comprehensive literature review of PubMed, Cochrane library and Google Scholar was conducted to obtain data for clinical efficacy and costs. Clinical efficacy values were obtained from randomized clinical trials. The primary efficacy measure was the proportion of participants achieving HbA1c levels <7.0%. Base case analysis was analyzed as incremental cost per effective treatment. One way sensitivity analysis was performed by varying costs by 10% associated with drug treatment to evaluate the robustness of the model. **RESULTS:** In the base-case analysis, saxagliptin was found to have better clinical outcomes and lower costs than linagliptin as a combination therapy with metformin with an incremental cost effectiveness ratio of 30.51. Considering only direct costs for the treatment, expected cost per effective treatment for a year was found to be \$179.25 for saxagliptin while that for linagliptin was \$298.99. Sensitivity analysis also indicated saxagliptin to be the dominant treatment option. **CONCLUSIONS:** Saxagliptin in our study was found to be favored over linagliptin in combination with metformin for the treatment of Type II Diabetes. These results may help decision makers develop appropriate treatment options. Type II diabetes being a lifestyle disorder, further research by inclusion of indirect costs associated with the treatment options may help strengthening the results.

PDB76

WEIGHT GAIN, HYPOGLYCAEMIA AND COST-EFFECTIVENESS: WHAT DRIVES VALUE AMONG TYPE 2 DIABETES TREATMENTS IN THE SHORT TERM

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OBJECTIVES: Current treatment options for managing type 2 diabetes (T2D) have significant and varied effects upon patient weight and the incidence of hypoglycaemia. In the short term, and from the patient's perspective, the absolute clinical effects of therapies are usually observed in the year succeeding therapy initiation. Consequently there has been a growing interest among payers and providers to understand the influence of weight and hypoglycaemia on the cost-effectiveness of T2D treatments. **METHODS:** With this in mind we developed an economic model that quantified the quality of life and cost consequences associated with different oral treatment strategies over a 1-year time horizon, focusing on the effect of weight change and incidence of hypoglycaemia. We illustrate these issues in patients adding dapagliflozin (DAPA) or DPP-4 inhibitors (DPP-4i) to metformin mono-therapy (MET). Data describing costs, utilities and absenteeism were sourced from the published literature. The model adopts a US societal perspective by including direct and indirect costs and benefits and US specific data where possible. **RESULTS:** The mean (95% CI) quality adjusted life year (QALY) difference in the DAPA vs. DPP-4i comparison (0.02: 0.75 vs. 0.73) was driven by the weight advantage of DAPA with no appreciable difference in expected costs (\$34: \$8,426 vs. \$8,392). DAPA was cost-effective with a cost per-QALY gained estimate of \$2,090. **CONCLUSIONS:** In the context of this evaluation the driver of economic value over the 1-year period following therapy initiation was weight reduction mediated through quality of life gains; whilst a lower incidence of hypoglycaemia was associated with cost offsets in medical expenditure and quality of life gains, there was no appreciable difference in rates of hypoglycaemia, and hence hypoglycaemia did not drive cost-effectiveness, between the two groups.

PDB77

SHORT-TERM ECONOMIC AND CLINICAL OUTCOMES OF CANAGLIFLOZIN COMPARED TO SITAGLIPTIN IN THE MANAGEMENT OF TYPE 2 DIABETES MELLITUS (T2DM)

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OBJECTIVES: Short-term cost per outcome analyses focusing on efficient attainment of desired health care outcomes, including quality measures can be useful decision-making tools for managed-care payers. Therefore, a simple cost-efficiency model was developed to compare the short-term (i.e., 1-year) clinical and economic outcomes of treating hyperglycemia with canagliflozin versus sitagliptin in people with T2DM. **METHODS:** Data on clinical efficacy and key adverse events (AEs) were obtained from a pooled analysis of 2 comparative trials of canagliflozin 300 mg/day versus sitagliptin 100 mg/day. Wholesale drug acquisition costs were used. The total and diabetes-related cost savings associated with achieving (vs. not achieving) A1C <7% was specified as \$3,055/year and \$1,651/year, respectively, based on previously reported claims database analysis. Savings of \$288/year associated with 1% decrease in weight, sourced from the literature was applied. AE-related costs (i.e., \$105-\$154/genital mycotic infections and \$532/hypoglycemia requiring third-party assistance) were derived from treatment algorithms, literature, and reimbursement rates. Total costs, average and incremental costs/key outcomes were calculated. **RESULTS:** In the simplest analysis evaluating drug cost/outcome only, where annual drug-related costs were similar (canagliflozin 300 mg \$3,660 vs sitagliptin \$3,594), the average cost/patient achieving A1C <7% were lower for canagliflozin 300 mg compared to sitagliptin (\$7,162 vs \$8,398/patient per year, respectively). Likewise, the average cost per 1% reduction in A1C were lower for canagliflozin 300 mg versus sitagliptin (\$3,893 vs \$5,364). In a comprehensive analysis including medical, drug, and adverse event costs, canagliflozin 300 mg dominates sitagliptin in incremental cost efficiency in A1C goals. Canagliflozin 300 mg resulted in net savings of \$639 per patient / year compared to sitagliptin. **CONCLUSIONS:** Based on inputs and assumptions used in this model, this 52-week economic analysis suggests that canagliflozin

300mg is likely to be a cost-saving treatment option compared with sitagliptin 100 mg when used in combination with other antihyperglycemic agents to treat T2DM.

PDB78

THE COST-EFFECTIVENESS OF LIRAGLUTIDE VS EXENATIDE FOR THE TREATMENT OF TYPE 2 DIABETES IN THE UNITED STATES

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INTRODUCTION: The global clinical and economic burden of type 2 diabetes is substantial. New GLP-1 receptor agonists have shown a multifactorial clinical profile with the potential to address many of clinical needs. **OBJECTIVES:** The objective of this study is to evaluate the cost-effectiveness of once-daily liraglutide vs. once-weekly exenatide in patients who had failed in metformin, sulfonylurea, or both treatments. **METHODS:** A Markov model is made to predict life expectancy and QALYs of liraglutide and exenatide. Baseline characteristics are consistent with DURATION-6 clinical trial. Simulations were run over 35 years (one year as a cycle) from a third-party payer perspective. Future costs and benefits are discounted at 3%. 5 health states were included in the model: "No complications", "Microvascular complications", "Macrovascular complications", "both complications" and "Death". Data was extracted from previous studies, head-to-head clinical trial, U.S. consumer Price Index, U.K. Perspective Diabetes Survey, Action in Diabetes and Vascular Disease trials, Action to Control Cardiovascular Risk in Diabetes trials and National Health Interview Survey data. The transition probabilities in the model vary by the age and gender of the patients to simulate the natural progression of type 2 diabetes. **RESULTS:** Liraglutide is associated with improvement of 0.15 QALY. Even though it costs more than exenatide, it is still more cost-effective than exenatide. The incremental cost-effectiveness ratios per QALY gained with liraglutide is \$138,282 (2013 US\$), which is less than 3 times GDP per capita in 2013. Sensitivity analysis was done. Figures in the model were adjusted reasonably, and the results remain robust. In other word, liraglutide is more cost-effective than exenatide. **CONCLUSIONS:** Long-term projections indicated that liraglutide (injected daily) is more cost-effective than exenatide (applied weekly).

PDB79

CONTRASTING COST EFFECTIVENESS RESULTS DERIVED FROM THE UKPDS 68 AND 82 RISK EQUATIONS IN TYPE 2 DIABETES

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OBJECTIVES: The IMS CORE Diabetes Model (CDM) is a widely published and previously validated decision support tool. The model uses the UKPDS 68 risk equations (REs) to predict events and has been updated to include the UKPDS 82 REs. The objective of this study was to compare cost-effectiveness (CE) results obtained via the UKPDS 82 and 68 REs. **METHODS:** Lifetime analyses were conducted using the CDM to evaluate the CE of metformin+ sulphonylurea (M+S) compared to metformin + DPP-4 (M+D). Basal insulin rescue therapy (BI) was applied to both arms at HbA1c threshold levels of 7.5%. Efficacy data for dual therapy was sourced from a published mixed treatment comparison; HbA1c and BMI change of -0.8% and 0.199kg/m2 (M+D); -0.79% and 0.707kg/m2 (M+S) and -0.82 and 0.545 kg/m2 (BI), respectively, were applied. Hypoglycemia rates were estimated based on odds ratios from the same systematic review. Results were obtained using for the UKPDS 82 and UKPDS 68 REs. US 2012 costs were used and discounting was applied at 3.5%. **RESULTS:** Quality adjusted life expectancy was 8.157 and 8.038 in patients treated with M+D and M+S using UKPDS 68 REs and 7.851 and 7.733 using UKPDS 82 REs. Total direct costs were estimated at \$77,656 and \$66,276 respectively for patients treated with M+D and M+S using UKPDS 68 REs and \$59,130 and \$47,664 respectively using UKPDS 82 REs. Incremental differences between REs were less pronounced; incremental costs per quality adjusted life year (QALY) gained were \$96,088 and \$97,545 using UKPDS 68 compared to UKPDS 82 REs. **CONCLUSIONS:** The UKPDS risk equations are widely used in type 2 diabetes cost-effectiveness models. While the new equations predict appreciable differences in absolute costs and quality adjusted life expectancy the incremental differences were marginal. Consequently health economic evaluations using the new UKPDS82 equations appear unlikely to result in significantly different results compared with the UKPDS68 REs.

PDB80

ILLUSTRATING THE RELATIONSHIP BETWEEN THE NUMBER OF HYPOGLYCAEMIA EVENTS, EVENT RATE REDUCTION AND THE IMPACT ON ESTIMATES OF QUALITY OF LIFE IMPROVEMENT IN HEALTH ECONOMIC STUDIES

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OBJECTIVES: Independent studies have demonstrated that the health utility gain associated with the per-event avoidance of non-severe hypoglycaemia episodes (NSHE) varies according to the baseline rate. Despite this many health technology assessments persist in using a mean per-event health disutility. The objective of this study was to quantify the bias introduced into an economic evaluation when using an average (static) disutility compared to a baseline event rate adjusted (diminishing) disutility. **METHODS:** We compared the one year disutility of daytime NSHE for an increasing annual event rate of 1, 5, 10 and 20 events per year. Disutility was assessed using a published non-linear approach assuming diminishing marginal disutility (D1) and compared to a static approach (S1) assuming a constant utility decline of 0.0052 per NSHE. Incremental utility was assessed assuming a comparator intervention associated with (A) 1 NSHE less per year and (B) a 50% reduction in NSHE rate. **RESULTS:** The disutilities associated with NSHE event rates of 1, 5, 10 and 20 events per year were 0.014, 0.024, 0.031 and 0.039 respectively using the marginal disutility assumption (D1) and 0.005, 0.026, 0.052 and 0.104 respectively using the static approach (S1). Utility gain for 1 NSHE avoided per year was 0.014, 0.002, 0.001 and 0.001 (D1) and 0.005, 0.005, 0.005 and 0.005 (S1), respectively. Assuming a 50% reduction in the rate of NSHE was associated with utility gains of 0.007, 0.005, 0.006